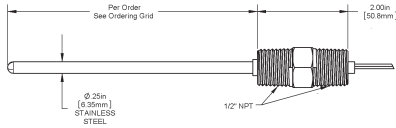


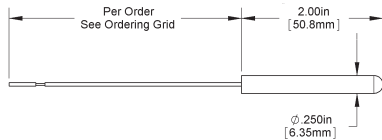
#### Overview

The Extreme Temperature Sensor is made for thermowell mounting, direct insertion or remote probe mounting. The probe is made of Stainless Steel and made in different lengths for a custom fit. The RTD's are available in 100Ω or 1KΩ 385 curve as shown in the specifications. The enclosures come in plastic or metal for both NEMA 3R and NEMA 4 applications and are all plenum rated.

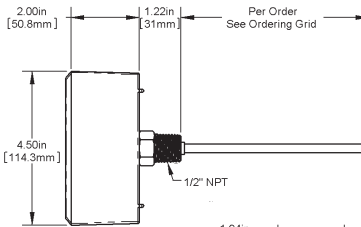
#### Identification



**Fig. 1:** Extreme Temp Immersion Sensor

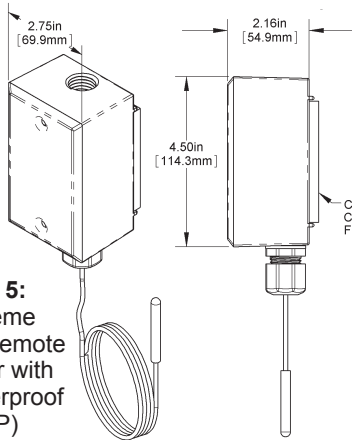
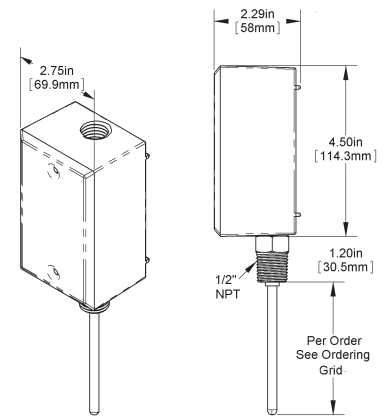


**Fig. 2:** Extreme Temp Remote Probe

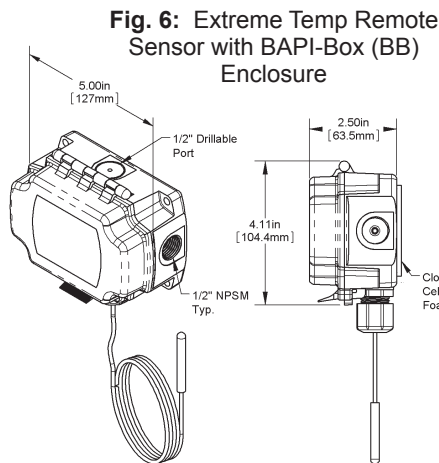


**Fig. 3:** Extreme Temp Immersion with Weatherproof (WP) Enclosure, Standard Mount

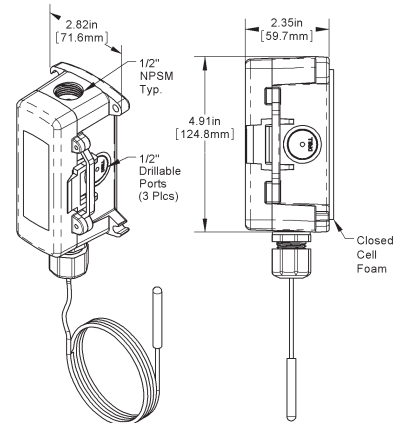
**Fig. 4:** Extreme Temp Immersion with Weatherproof (WP) Enclosure, Outside Mount



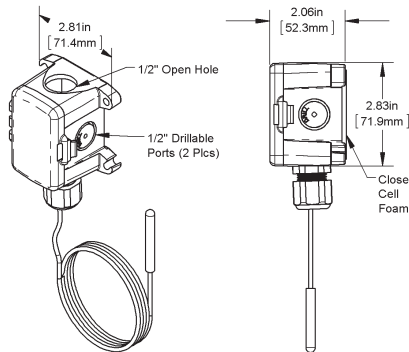
**Fig. 5:** Extreme Temp Remote Sensor with Weatherproof (WP) Enclosure



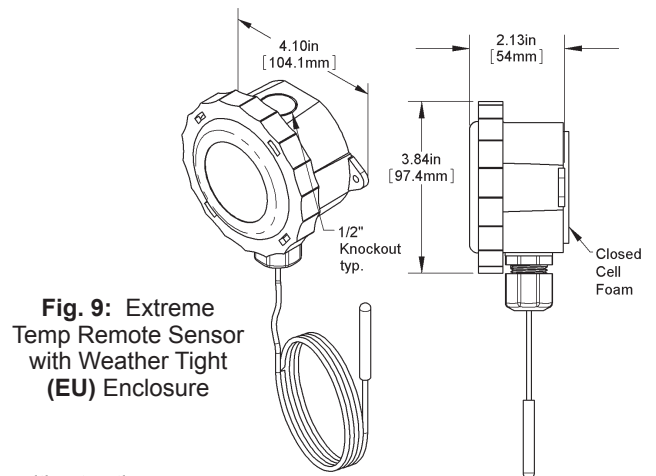
**Fig. 6:** Extreme Temp Remote Sensor with BAPI-Box (BB) Enclosure



**Fig. 7:** Extreme Temp Remote Sensor with BAPI-Box 2 (BB2) Enclosure



**Fig. 8:** Extreme Temp Remote Sensor with BAPI-Box 4 (BB4) Enclosure  
(A Pierceable Knockout Plug is available from BAPI for the open port in the BB4. Part #BA/PKP-100)



**Fig. 9:** Extreme Temp Remote Sensor with Weather Tight (EU) Enclosure

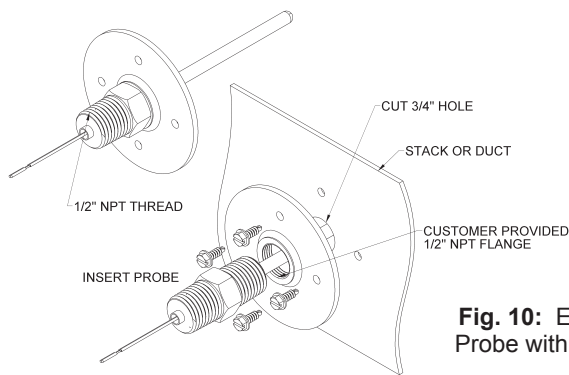
Specifications subject to change without notice.

## Mounting

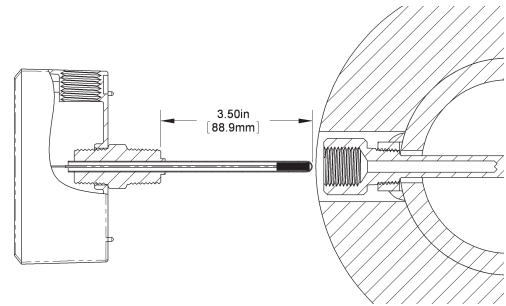
**Application:** Figure 9 shows a typical four-inch thermowell and four-inch immersion probe installed into an eight inch pipe. In a properly insulated pipe with liquid or steam, the temperature is essentially the same across the entire cross section of the pipe. Usually thermowells are sized to extend to the center of the pipe; however, shorter thermowells will give proper temperature readings if properly insulated. The shorter thermowells are used in pipes with high flow velocities. See Application notes "Thermowells Explained" on our website at [www.bapihvac.com](http://www.bapihvac.com)

**Thermowell Installer:** Typically a Pipe Fitter drills a 3/4-inch hole into the pipe where the thermowell is needed. A customer provided fitting, called a Threadolet or Weldolet, is welded to the pipe over the hole. The Threadolet has a 1/2" NPT thread in the center. Thread sealant such as Teflon tape or pipe dope is applied to the 1/2" NPT threads of the thermowell. The thermowell is then inserted into the Threadolet and tightened. Estimates on insertion depths can be seen in our Application note "Thermowells Explained" on our website at [www.bapihvac.com](http://www.bapihvac.com)

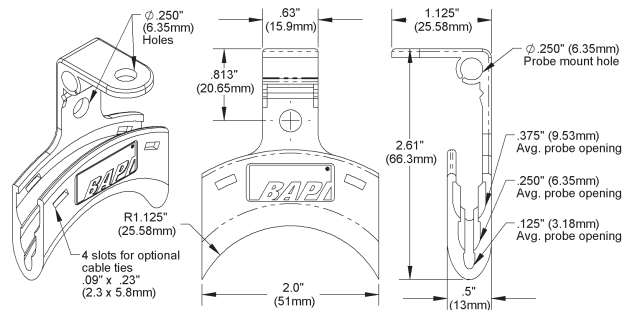
**Sensor Installation:** Insert the immersion sensor into the well with the stainless steel screw fitting into the opening on the well. Hand tighten the immersion sensor snugly without too much torque. Make sure that the tip of the immersion sensor is inserted as close to the well bottom as possible. The well is close fitting to the sensor and will offer an accurate reading without the need for thermal compound.



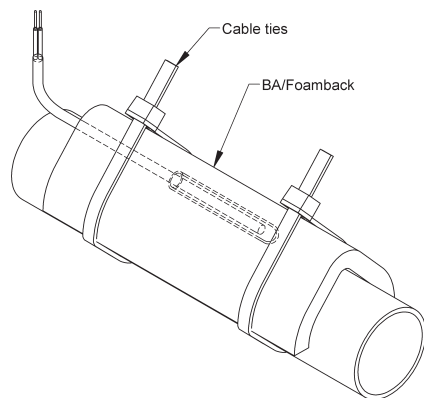
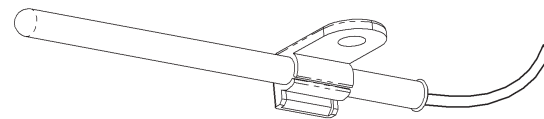
**Fig. 10:** Extreme Temp Probe with flange mount



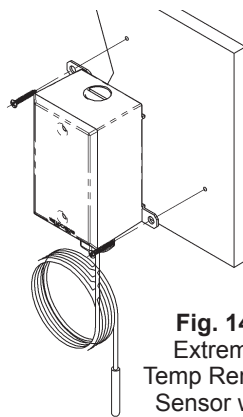
**Fig. 11:** Extreme Temp Immersion with Weatherproof Enclosure



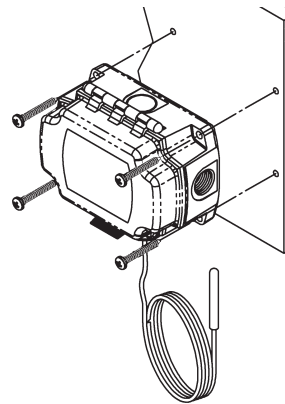
**Fig. 12:** Remote Sensor mounting using the scored break off of the Flexible Probe Bracket (FPB) which is shown at left.



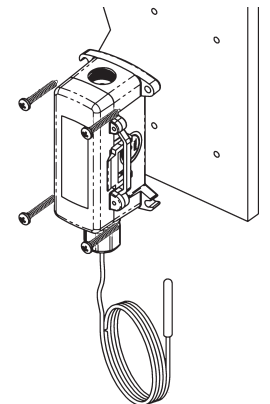
**Fig. 13:** Extreme Temp Remote Sensor in a strap-on application



**Fig. 14:** Extreme Temp Remote Sensor with Weatherproof (WP) Enclosure



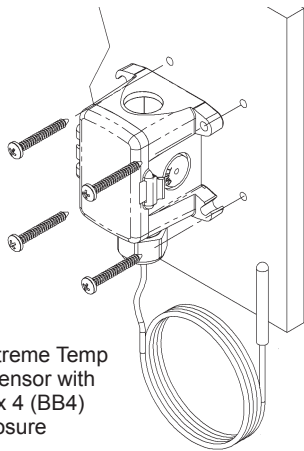
**Fig. 15:** Extreme Temp Remote Sensor with BAPI-Box (BB)



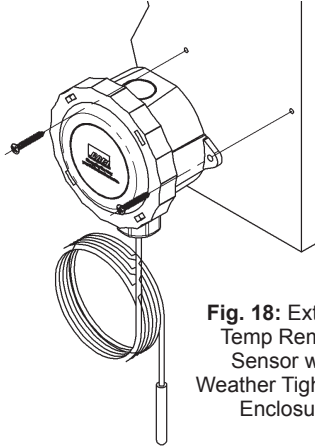
**Fig. 16:** Remote Sensor with BAPI-Box 2 (BB2)

Specifications subject to change without notice.

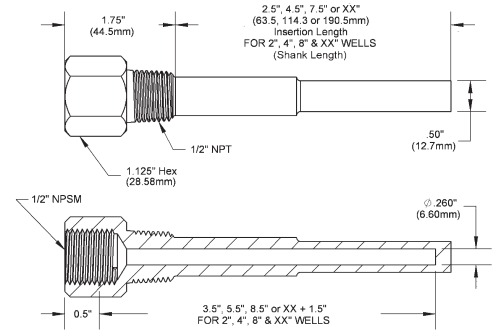
## Mounting continued...



**Fig. 17:** Extreme Temp Remote Sensor with BAPI-Box 4 (BB4) Enclosure



**Fig. 18:** Extreme Temp Remote Sensor with Weather Tight (EU) Enclosure

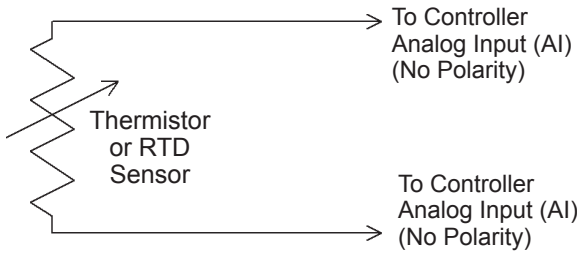


**Fig. 19:** Immersion Thermowell

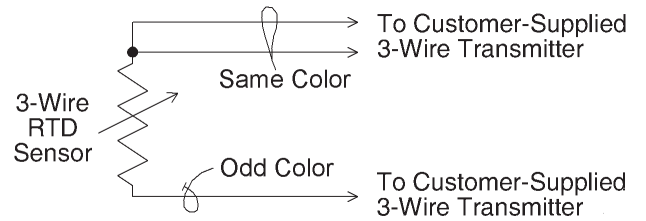
## Wiring & Termination

BAPI recommends using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. Larger gauge wire may be required for long runs. All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run this device's wiring in the same conduit as high or low voltage AC power wiring.

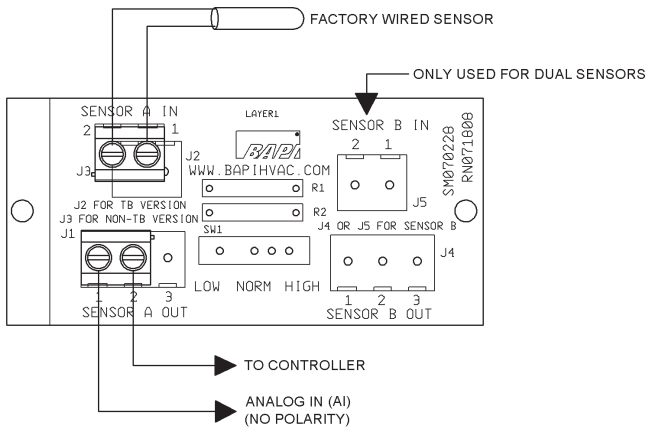
BAPI's tests show that inaccurate signal levels are possible when AC power wiring is present in the same conduit as the sensor wires.



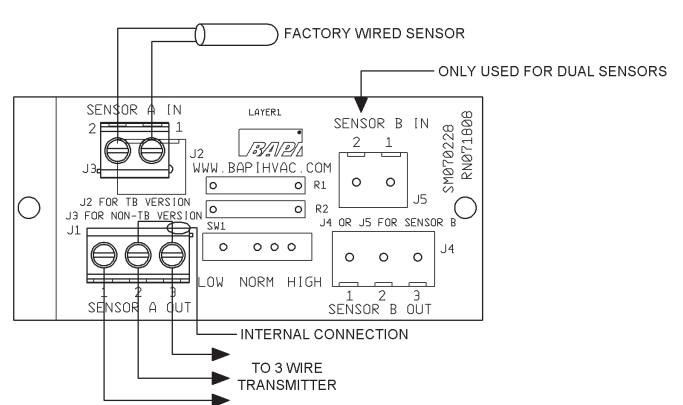
**Fig. 20:** 2 Wire Lead Wire Termination for Thermistor or RTD



**Fig. 21:** 3 Wire Lead Wire Termination for RTD



**Fig. 22:** Terminal Strip (-TS) Option for 2 Wire Sensors Termination



**Fig. 23:** Terminal Strip (-TS) Option for 3 Wire Sensors Termination



**Diagnostics**

**Problems:**

Controller reports higher or lower than actual temperature

**Possible Solutions:**

- Confirm the input is set up correctly in the front end software
- Check wiring for proper termination & continuity. (shorted or open)
- Disconnect wires and measure sensor resistance and verify the "Sensor" output is correct.

**Specifications**

<b>Sensor</b>	Passive resistance
RTD	PTC, 2 or 3 wire
<b>RTD</b>	Resistance Temperature Device
Platinum (Pt)	1KΩ @0°C, 385 curve,
Pt Accuracy (std)	0.12% @Ref, or ±0.55°F, (±0.3°C)
Pt Stability	±0.25°F, (±0.14°C)
Pt Self Heating	0.4 °C/mW @0°C
<b>RTD Probe range</b>	
1KΩ [1]	-328 to 32°F, (-200 to 0°C)
1KΩ [2]	77 to 500°F, (25 to 260°C)
1KΩ [3]	77 to 1,112°F, (25 to 600°C)
<b>Sensitivity</b>	Approximate @ 32°F (0°C)
RTD (Pt)	3.85Ω/°C for 1KΩ RTD 0.385Ω/°C for 100Ω RTD
<b>Lead wire</b>	22awg stranded
<b>Wire Insulation</b>	Plenum rated
1KΩ[1]	PTFE, -328 to 32°F, (-200 to 0°C)
1KΩ[2]	PTFE, 77 to 500°F, (25 to 260°C)
1KΩ[3]	Fiberglass, 77 to 1,112°F, (25 to 600°C)
<b>Probe</b>	Rigid, 304 Stainless Steel, 0.25" OD
<b>Probe Length</b>	
Probe	2", 4", 8" or custom per order
Remote Sensor	2" w/ customer cable length
<b>Mounting</b>	
Probe	½" NPT Double Threaded
Remote Sensor	Probe with or without enclosure

**Enclosure Types**

Note: The double threaded immersion probe is only available with the Weatherproof (-WP) box due to the very high or very low temperature RTD capabilities.

Weatherproof	<b>-WP</b> , w/ two ½" FNPT entries, (Bell box)
BAPI-Box	<b>-BB</b> , w/ our ½" NPSM & one ½" drill-out
BAPI-Box 2	<b>-BB2</b> , w/ three ½" NPSM & three ½" drill-outs
BAPI-Box 4:	<b>-BB4</b> , w/ four ½" drill-outs & one ½" open port
Weather Tight	<b>-EU</b> , w/ two ½" knockouts

**Enclosure Ratings**

Weatherproof	<b>-WP</b> , NEMA 3R, IP14
BAPI-Box	<b>-BB</b> , NEMA 4X, IP66
BAPI-Box 2	<b>-BB2</b> , NEMA 4X, IP66
BAPI-Box 4	<b>-BB4</b> , IP10 (IP44 with Knockout Plug in the open port)
Weather Tight	<b>-EU</b> , NEMA 4X, IP66

**Enclosure Materials**

Weatherproof	<b>-WP</b> , Cast Aluminum, UV rated
BAPI-Box	<b>-BB</b> , Polycarbonate, UL94V-0, UV rated
BAPI-Box 2	<b>-BB2</b> , Polycarbonate, UL94V-0, UV rated
BAPI-Box 4	<b>-BB4</b> , Polycarbonate & Nylon, UL94V-0
Weather Tight	<b>-EU</b> , ABS Plastic, UL94V-0

**Ambient (Encl.)**

0 to 100% RH, Non-condensing	
All 3 BAPI-Boxes	-40°F to 185°F, (-40° to 85°C)
Weather Tight	-40°F to 185°F, (-40° to 85°C)
Weatherproof	-100°F to 1,000°F, (-73° to 538°C)

**Agency**

RoHS, CE  
 PT= DIN43760, IEC Pub 751-1983,  
 JIS C1604-1989